



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,931	06/04/2001	Robert D. Horning	H16-16009 US	4429

7590 04/23/2003

John G. Shudy, Jr.  
Patent Services  
Honeywell International Inc.  
101 Colombia Road  
Morristown, NJ 07962

EXAMINER

RAO, SHRINIVAS H

ART UNIT PAPER NUMBER

2814

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/873,931

Applicant(s)

HORNING ET AL.

Examiner

Steven H. Rao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 1-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 19-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Priority***

The application as currently filed does not claim priority from any earlier filed Patent Application, therefore currently the earliest available filing date is the U.S. filing date namely June 04, 2001.

### ***Election/Restrictions***

Claims 1-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected claims, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 4.

### ***Preliminary Amendment Status***

Acknowledgment is made of entry of preliminary amendment filed on 9/24/ 01 and the changes to the specification stated in the preliminary amendment have been made of record.

Claims 19 to 36 are currently examined in the application.

### ***Drawings***

The drawings filed on June 04, 2001 have been objected to by the draftsman for reasons set out in the enclosed PTO-948. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

Art Unit: 2814

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 19-21 and 28-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Wu et al. (U.S. Patent No. 6,521,041, herein after Wu).

It is noted that claims 19 and 28 are presently in product by process format and must be rewritten in independent form to include all the limitations of the corresponding process claims 1 and 10.

With respect to claim 19, Wu describes a device produced according to the method of claim 1. (Wu lightly doped silicon substrate having first and second side and less than  $5 \times 10^{19} \text{ cm}^{-3}$  boron therein – Wu fig. 1Dcol. 4 line 29; placing a p+ layer on the first side of the substrate having a boron content of greater than  $7 \times 10^{19} \text{ cm}^{-3}$  and a germanium content of  $1 \times 10^{21} \text{ cm}^{-3}$  (Wu – boron -abstract line14, Germanium col. 10lines 20-25; a mask on the second side to etch a predetermined pattern- Wu col. 8 lines 5-10, 30-40; etched second side of the p + layer – Wu col. 8 lines 6–7,35-40, lines ; an insulator on said p+ layer and fabricating an electronic component on said insulator (insulator fig. 10 in the embodiment when layer 1008 is bulk insulating material, col.13 lines 50-54 – col. 14 lines 7-10 and electronic components – col. 7 lines 50-60).

With respect to claim 20, Wu describes the device of claim 19, wherein said boron content is greater than  $1 \times 10^{20} \text{ cm}^3$  (Wu col. 4 line 51)and the germanium

Art Unit: 2814

content is from about  $0.5 \times 10^{21} \text{ cm}^{-3}$  to about  $2.0 \times 10^{21} \text{ CM}^{-3}$ . (Wu col. 10 line 20-25).

With respect to claim 21 Wu describes the device of claim 19, wherein said micromechanical structure is a pressure sensor. ( Wu col. 7 lines 54,58-59).

With respect to claim 28, Wu describes a device produced according to the method of claim 10. Claim 28 repeats the elements of claim 19 and recites an buried p+ layer below the lightly doped layer ( WU figure 1D).

With respect to claim 29, Wu describes the device of claim 28, wherein said boron content is greater than  $1 \times 10^{20} \text{ cm}^3$  ( Wu col. 4 line 51) and the germanium content is from about  $0.5 \times 10^{21} \text{ cm}^{-3}$  to about  $2.0 \times 10^{21} \text{ CM}^{-3}$ . ( Wu col. 10 line 20-25).

With respect to claim 30, Wu describes the device of claim 28, wherein said micromechanical structure is a pressure sensor. ( Wu col. 7 lines 54,58-59).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 22, 27 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. ( U.S. Patent No. 6,521,041, herein after Wu) as applied to

claims 19-21 above and in view of Stemme et al. (U.S. Patent No. 6,546,804, herein after Stemme).

With respect to claims 22 and 31 Wu describes the device of claim 21.

Wu does not specifically describe the electronic component is selected from the group consisting of dielectrically isolated piezoresistors and resonant microbeams.

However Stemme in col. 4 lines 11-12 and col. 7 lines 14 describes electronic component is selected from the group consisting of dielectrically isolated piezoresistors and resonant microbeams to form ultraminiaturized sensors having high sensitivity in a cost effective manner .

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to specify Stemme's dielectrically isolated piezoresistors and resonant microbeams for the unspecified sensors of Wu in Wu's device to form ultraminiaturized sensors having high sensitivity in a cost effective manner . ( Stemme col. 2 lines 38-48).

With respect to claim 27 The device of claim 19, wherein said micromechanical structure includes a dielectrically isolated piezoresistor formed on a top surface of a first wafer, a second wafer is bonded to said first wafer, and said second wafer forms a single crystal piezoresistor. (Stemme fig. 16 and col. 2 lines 20-36 Wu figure 10 ).

**B.** Claims 23 to 26 , 32 to 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. ( U.S. Patent No. 6,521,041, herein after Wu) and Stemme et al. (U.S. Patent No. 6,546,804, herein after Stemme) as applied to claims above and further in view of Nilsson et al. ( U.S. Patent No. 6,252,335, herein after Nilsson).

With respect to claims 23 and 32 Wu describes the device of claim 19. Wu and Stemme do not specifically describe the micromechanical structure is a cantilevered accelerometer.

However Nilsson in its abstract line 1, etc. describes a cantilevered beam accelerometer to obtain a beam sensor that is small, very sensitive but with minimal orthogonal sensitivity and is highly resistant to shocks.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Nilsson's cantilevered accelerometer as the beam sensor described by Wu and Stemme in their ( WU and Stemme's ) devices to obtain a beam sensor that is small, very sensitive but with minimal orthogonal sensitivity and is highly resistant to shocks. ( Nilsson col. 1 lines 45 to 52).

With respect to claims 24 and 33 Wu, Stemme and Nilsson describe the device of claim 23, wherein said electronic component is selected from the group consisting of dielectrically isolated piezoresistors and resonant microbeams. (Stemme in col. 4 lines 11-12 and col. 7 lines 14).

With respect to claims 25 and 34 Wu, Stemme and Nilsson describe the device of claim 19, wherein said micromechanical structure is a dual web biplane accelerometer formed by forming a said p+ layer on both sides of said substrate, forming a proof mask and flexure etching on both sides of said layer until said etching reaches said p+ layers. ( Nilsson figure 1, figure 6, col. 4 lines 33 to 44).

With respect to claims 26 and 35 Wu, Stemme and Nilsson the device of claim 25, wherein said electronic component is selected from the group consisting of

Art Unit: 2814

dielectrically isolated piezoresistors and resonant microbeams. (Stemme in col. 4 lines 11-12 and col. 7 lines 14).

With respect to claims 31 and 35 Wu, Stemme and Nilsson describe the device of claim 30, wherein said electronic component is selected from the group consisting of dielectrically isolated piezoresistors and resonant microbeams.

With respect to claims 32 and 36 Wu, Stemme and Nilsson describe the device of claim 28, wherein said micromechanical structure is a cantilevered accelerometer.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (703) 306-5584. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 5:30 p.m.

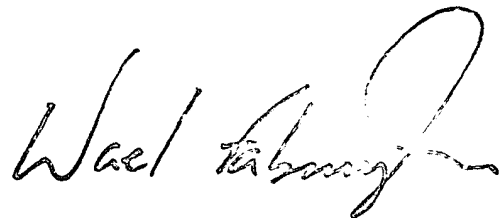
Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7724.



Steven H. Rao

Patent Examiner

April 19, 2003.



SUPERVISORY PRIMARY EXAMINER  
TECHNOLOGY CENTER 2800